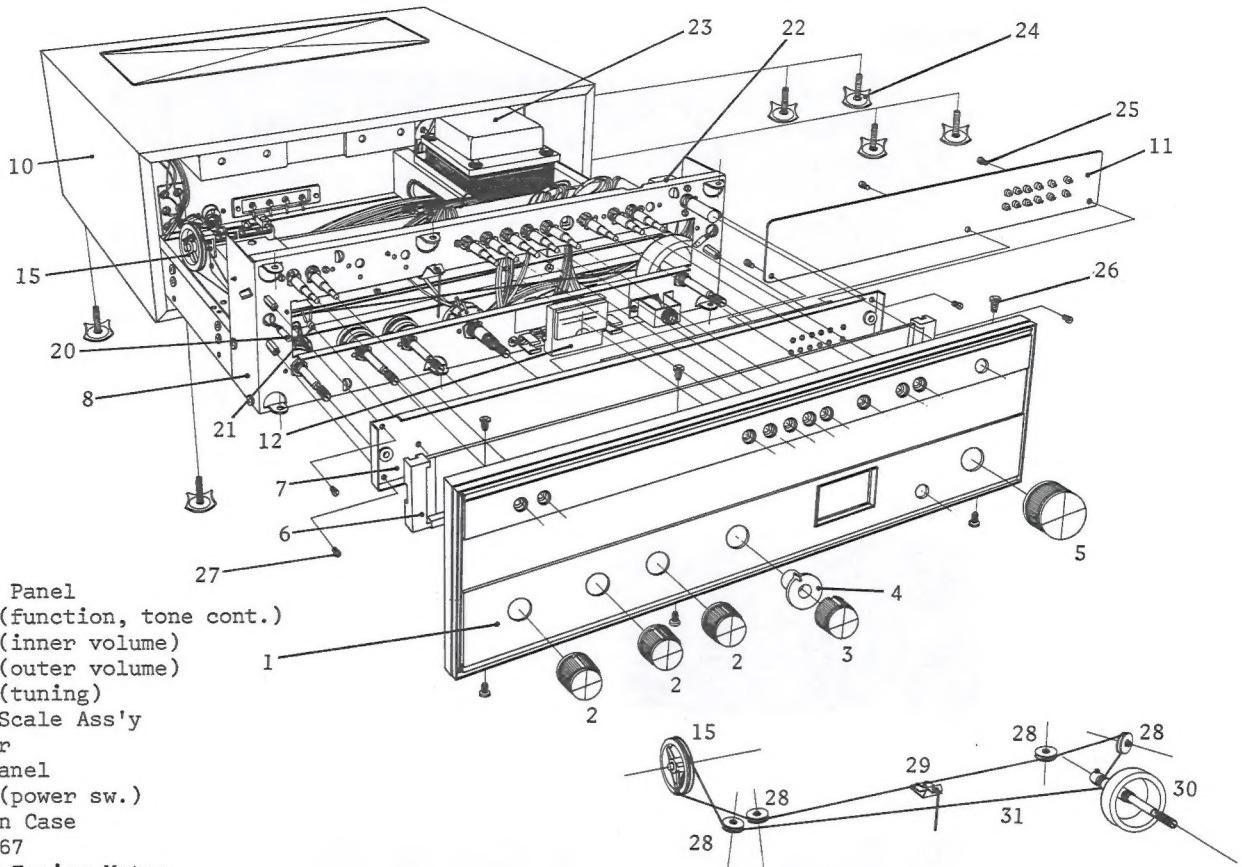
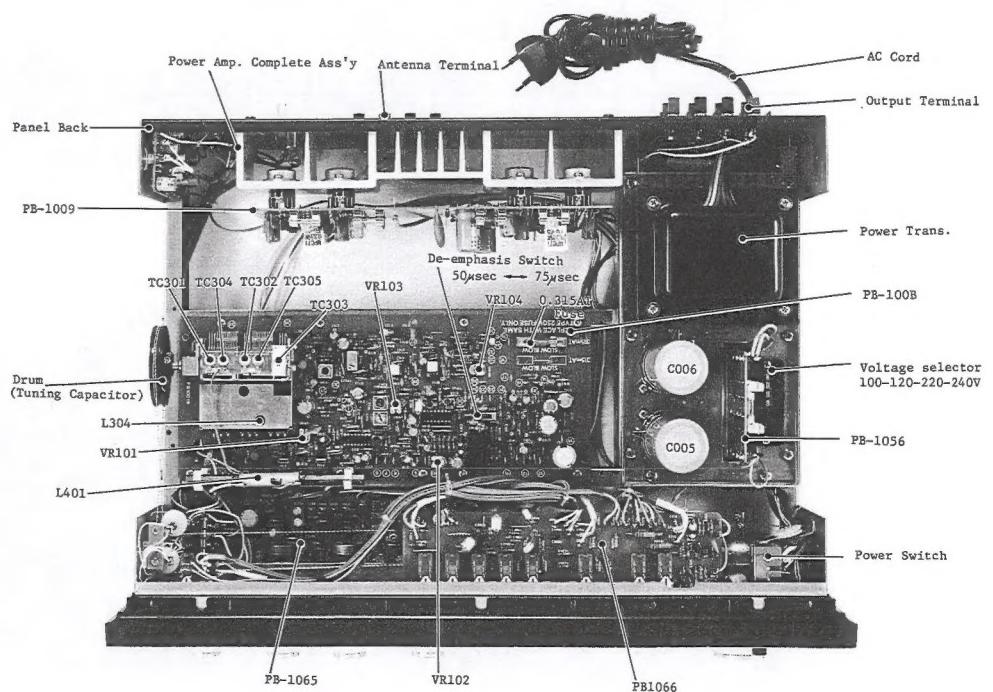
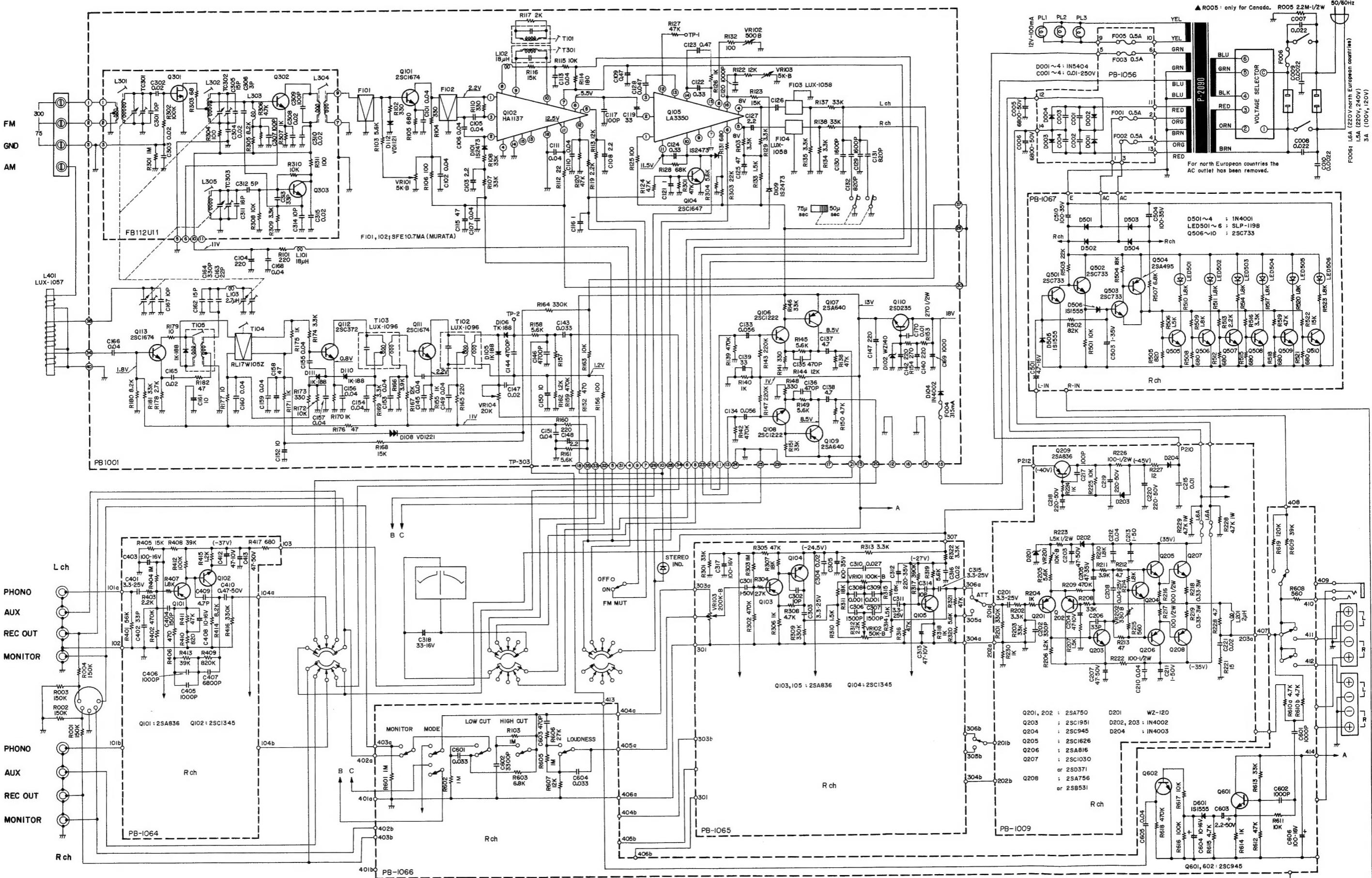


R-3800 SERVICE MANUAL



1. Front Panel
2. Knob (function, tone cont.)
3. Knob (inner volume)
4. Knob (outer volume)
5. Knob (tuning)
6. Dial Scale Ass'y
7. Holder
8. Sub Panel
9. Knob (power sw.)
10. Wooden Case
11. PB-1067
12. AM/FM Tuning Meter
13. Headphone Jack
14. L.E.D.'s (SLP-119B)
15. Drum (tuning capacitor)
16. Rotary Sw. (Y484)
17. Bass VR (100k ohms x 2)
18. Treble VR (50k ohms x 2)
19. Main Volume VR (200k ohms x 2)
20. Dial Lamp
21. L.E.D. (SLP-119B)
22. Power Switch (SDG-5P)
23. Power Trans. P-2090
24. Screw 4mm x 20mm
25. Screw 3mm x 6mm
26. Screw 4mm x 10mm
27. Screw 3mm x 6mm
28. Plastic Pulley
29. Tuning Pointer Ass'y
30. Tuning Shaft & Flywheel Ass'y
31. Dial Cord





PB-1056

| | | | |
|----------|---------------|----------|--------|
| C001 - 4 | 0.01uF 250V P | D001 - 4 | 1N5404 |
| F001 - 3 | 0.5A | F005 | 0.5A |

PB-1066

| | | | | | |
|------|------|------|------|------|------|
| R601 | 1M | R608 | 560 | R614 | 1K |
| 602 | 1M | 609 | 39K | 615 | 4.7K |
| 603 | 6.8K | 610a | 4.7K | 616 | 100K |
| 604 | 1M | 610b | 4.7K | 617 | 10K |
| 605 | 1M | 611 | 10K | 618 | 470K |
| 606 | 27K | 612 | 47K | 619 | 120K |
| 607 | 12K | 613 | 33K | | |

| | | | | | |
|------|-----------|------|-------------|------|-------------|
| C601 | 0.033uF P | C601 | 1000pF C | C605 | 0.04uF C |
| 602 | 3300pF ST | 602 | 1000pF C | 606 | 100uF 16V E |
| 603 | 470pF ST | 603 | 2.2uF 50V E | | |
| 604 | 0.033uF P | 604 | 10uF 16V E | | |

| | | | | | |
|------|--------|------|--------|------|--------|
| Q601 | 2SC945 | Q602 | 2SC945 | D601 | 1S1555 |
|------|--------|------|--------|------|--------|

PB-1067

| | | | | | |
|------|------|------|------|------|------|
| R501 | 10K | R509 | 1.8K | R517 | 1.8K |
| 502 | 82K | 510 | 1.8K | 518 | 680 |
| 503 | 22K | 511 | 1.8K | 519 | 4.7K |
| 504 | 18K | 512 | 680 | 520 | 1.8K |
| 505 | 820 | 513 | 2.2K | 521 | 680 |
| 506 | 1.5K | 514 | 1.8K | 522 | 15K |
| 507 | 6.8K | 515 | 680 | 523 | 1.8K |
| 508 | 680 | 516 | 3.3K | | |

| | | | | | |
|------|-------------|------|-------------|--|--|
| C501 | 4.7uF 16V E | C504 | 100uF 35V E | | |
| 503 | 1uF 35V E | 510 | 100uF 35V E | | |

| | | | | | |
|--------|--------|--------|--------|----------|----------|
| Q501-3 | 2SC733 | D501-4 | 1N4002 | LED501-6 | SLP-119B |
| 504 | 2SA495 | 505 | 1S1555 | | |
| 505-10 | 2SC733 | 506 | 1S1555 | | |

PB-1009

| | | | | | |
|------|------|------|--------------|------|-------------|
| R201 | 330K | R211 | 3.9K | R222 | 100 1/2W FP |
| 202 | 3.3K | 212 | 4.7K | 223 | 1.5K 1/2W |
| 203 | 33K | 213 | 47K | 224 | 1K |
| 204 | 1K | 214 | 1.8K | 225 | 10K |
| 205 | 5.6K | 215 | 560 | 226 | 100 1/2W FP |
| 206 | 1.2K | 216 | 100 1/2W FP | 227 | 12 |
| 207 | 1.5K | 217 | 100 1/2W FP | 228 | 4.7K 1W |
| 208 | 33K | 218 | 0.33 3W +10% | 229 | 4.7K 1W |
| 209 | 470K | 219 | 0.33 3W -10% | 230 | 1K |
| 210 | 1.8K | 221 | 15 | 220 | 4.7 1W |

| | | | | | |
|------|----------------|------|--------------|------|----------------|
| C201 | 3.3uF 25V E,LR | C208 | 0.04uF 25V C | C215 | 0.01uF 1.4KV C |
| 202 | 330pF C | 210 | 0.04uF C | 217 | 100pF C |
| 203 | 47uF 50V E | 211 | 1uF 50V E | 218 | 220uF 50V E |
| 204 | 47uF 10V E | 212 | 0.04uF C | 219 | 220uF 50V E |
| 205 | 47uF 35V E | 213 | 1uF 50V E | 220 | 220uF 50V E |
| 206 | 33pF C | 214 | 0.02uF 50V C | | |
| 207 | 47uF 50V E | | | | |

| | | | | | |
|------|--------------|------|---------|------|-------------------|
| Q201 | 2SA750 (1)DA | Q204 | 2SC945 | Q207 | 2SC1030 or 2SD371 |
| 202 | 2SA750 (1)DA | 205 | 2SC1626 | 208 | 2SA756 or 2SB531 |
| 203 | 2SC1951 | 206 | 2SA816 | | |

| | | | | | |
|------|--------|------|--------|--|--|
| D201 | WZ-120 | D203 | 1N4002 | | |
| 202 | 1N4002 | 204 | 1N4003 | | |

| | | | | | |
|-------|-------|-------|-------|------|-----|
| VR201 | 10K-B | VR202 | 330-B | L201 | 2uH |
|-------|-------|-------|-------|------|-----|

C I R C U I T D E S C R I P T I O N

[POWER SUPPLY]

The AC line is connected to the primary side of power transformer via a two pole power switch (front panel) and a voltage selector. Four windings are provided for the secondary side i.e. (1) 12 volt AC for the dial lamps. (2) 15 volts AC for tuner section: This 15V AC is half-wave rectified by D104 to obtain 18V unsmooth DC, which is further regulated by transistor Q110 and zener diode D102 to realize 13V regulated DC against $\pm 20\%$ AC line. (3) 35 volt AC for preamp (equalizer stage, intermediate stage and tone control): The 35V AC is half-wave rectified by D204 to obtain -45V unsmooth DC, which is turned into low noise -40V DC via ripple filter Q209. Actual supply voltage at each section is; equalizer stage -37V, tone control -27V, intermediate stage -24.5V, all of which are determined by the voltage-drop at the de-coupling circuit placed in each stage. (4) 30 volt $\times 2$ AC for main amp.: The 30V $\times 2$ AC are rectified by D001 - D004 and then led to large filtering capacitors C005 and C006 (6800 μ F $\times 2$) to obtain dual supply +35V, -35V. (5) 21 volt $\times 2$ AC for Peak Indicator, which are tapped out from the same winding of the above (4). The 21V $\times 2$ AC are rectified by D501 - D504 to obtain dual supply +23V and -23V.

[PRE AMP SECTION]

The pre-amplifier consists of an equalizer, and intermediate amplifier, and a tone control. The equalizer adopts the Negative Feedback circuit using two silicon transistors, 2SA836 (Q101), 2SC1345 (Q102) per channel and is designed to provide proper equalization to the input signals. Input signals given through the AUX and TUNER section bypass the equalizer and are fed directly to the later stages of this amplifier.

Controls arranged after the equalizer stage are: REC. OUT connector, TAPE MONITOR SWITCH, LOW-CUT FILTER, HIGH-CUT FILTER, MODE SELECTOR, VOLUME CONTROL, and LOUDNESS SWITCH. The intermediate amplifier consisting of Q103, Q104 is a flat amplifier adopting 2-stage Negative Feed-back circuit which is designed to boost the equalizer, tuner or AUX. This covers sufficiently the insertion loss by the tone control in the next stage and leads low impedance output to the tone control for its smooth function. The tone control adopts the CB-NF-circuit of Q105. Any desired frequency response can be adjusted by the following controls: Variable resistor VR101 (Bass), and variable resistor VR102 (TREBLE). Major components of the pre-amplifier are arranged on the printed circuit boards PB1064 - 1066. (PB1064 for Equalizer, PB1065 for Filters, Loudness and Mode, PB1066 for Flat Amp and Tone Control)

[MAIN AMPLIFIER]

The main amplifier is of full stage direct coupling, one stage differential amplification, predriving and fully complementary circuits. The power transistors Q207 2SD371 (NPN) and Q309 2SB531 (PNP) (2-transistor per channel) are fitted over to the heat sink inside the chassis. All components are assembled to the printed circuit board PB1009. The differential amplifier is consisted of Q201 and Q202, the pre-driving stage of Q203, and the driver transistors, Q205 and Q206. Besides the above transistors, capacitors, resistors, and semi-fixed volume controls are integrated in the circuit.

[AM SECTION]

The RF signal received by the ferrite-rod antenna is converted into 455KHz IF frequency by Q113. The output of the local oscillation circuitry composed of Q113 and T105 is mixed in Q113 with the incoming radio signal to provide the 455KHz IF frequency, which is connected to the next stage.

| | | | | | | | |
|-------|-------|------|-----------|------|-------|------|-------|
| VR101 | 5K-B | F101 | SFE10.7MA | L101 | 18uH | F004 | 315mA |
| 102 | 500-B | 102 | SFE10.7MA | 102 | 18uH | | |
| 103 | 5K-B | 103 | LUX-1058 | 103 | 2.7uH | | |
| 104 | 20K | 104 | LUX-1058 | | | | |

| | | | |
|------|----------|------|-----------|
| T101 | LA-1093 | T104 | RLL7W105Z |
| 102 | LUX-1096 | 105 | LUX-1073 |
| 103 | LUX-1096 | T301 | LA-1092 |

FB112U11

| | | | | | |
|------|------|------|------|------|------|
| R301 | 1M | R305 | 8.2K | R309 | 3.3K |
| 302 | 100K | 306 | 4.7K | 310 | 10K |
| 303 | 68 | 307 | 1K | 311 | 100 |
| 304 | 100 | 308 | 10K | | |

| | | | | | |
|------|----------|------|----------|------|----------|
| C301 | 10pF C | C306 | 3pF C | C311 | 16pF C |
| 302 | 0.02uF C | 307 | 100pF C | 312 | 5pF C |
| 303 | 0.02uF C | 308 | 0.02uF C | 313 | 33pF C |
| 304 | 0.02uF C | 309 | 100pF C | 314 | 10pF C |
| 305 | 15pF C | 310 | 0.02uF C | 315 | 0.02uF C |

| | | | | | |
|------|----------------|------|--------|------|-------------------|
| Q301 | 2SK19 or 2SK55 | Q302 | 2SC535 | Q303 | 2SC1342 or SE3001 |
|------|----------------|------|--------|------|-------------------|

PB-1064

| | | | | | |
|------|--------|------|--------|------|-------|
| R401 | 56K | R407 | 1.8K | R413 | 39K L |
| 402 | 470K L | 408 | 39 | 414 | 8.2K |
| 403 | 2.2K | 409 | 820K L | 415 | 1.2K |
| 404 | 1M L | 410 | 820 L | 416 | 330K |
| 405 | 15K | 411 | 47K L | 417 | 680 |
| 406 | 470 | 412 | 100K L | | |

| | | | | | |
|------|-------------|------|---------------|------|------------|
| C401 | 2.2uF 25V T | C406 | 1000pF P | C412 | 47uF 10V E |
| 402 | 33pF C | 407 | 6800pF P | 413 | 47uF 50V E |
| 403 | 100uF 16V E | 408 | 10uF 16V E,LL | | |
| 404 | 150pF C | 409 | 4.7pF C | | |
| 405 | 1000pF P | 410 | 0.47uF 35V T | | |

| | | | | | |
|------|---------|------|----------|--|--|
| Q101 | 2SA836E | Q102 | 2SC1345E | | |
|------|---------|------|----------|--|--|

PB-1065

| | | | | | |
|------|------|------|------|------|------|
| R301 | 33K | R309 | 330K | R317 | 390K |
| 302 | 470K | 310 | 1.5K | 318 | 1K |
| 303 | 1M | 311 | 18K | 319 | 5.6K |
| 304 | 2.7K | 312 | 2.2K | 320 | 5.6K |
| 305 | 47K | 313 | 3.3K | 321 | 47K |
| 306 | 1K | 314 | 1.5K | 322 | 3.3K |
| 307 | 18K | 315 | 18K | | |
| 308 | 4.7K | 316 | 47K | | |

| | | | | | |
|------|-----------------|------|----------------|------|----------------|
| C301 | 1uF 50V E, LR | C307 | 1500pF P | C313 | 47uF 10V E |
| 302 | 10pF C | 308 | 0.001uF P | 314 | 10pF C |
| 303 | 3.3uF 25V E, LR | 309 | 0.001uF P | 315 | 3.3uF 25V E,LR |
| 304 | 0.02uF C | 310 | 0.027uF P | 316 | 0.02uF C |
| 305 | 100uF 35V E | 311 | 3.3uF 25V E,LR | 317 | 100uF 16V E |
| 306 | 1500pF P | 312 | 220uF 35V E | 318 | 33uF 16V E |

| | | | | | |
|------|---------|------|----------|------|---------|
| Q103 | 2SA836E | Q104 | 2SC1345E | Q105 | 2SA836E |
|------|---------|------|----------|------|---------|

| | | | | | |
|-------|--------|-------|-------|-------|--------|
| VR103 | 200K-B | VR102 | 50K-B | VR101 | 100K-B |
|-------|--------|-------|-------|-------|--------|

Only the desired signal is selected by T104, a ceramic filter of sharp characteristic. The selected signal is then amplified by the 455KHz IF amplifier composed of Q112 and Q111 and is detected by D106.

For a strong signal, a strong AGC action can be applied by lowering the base potential of Q112, when the collector potential of Q112 increases, and D110 and D111 are being released, which by-passes the signal level given to the base of Q112. Normally these D110 and D111 are of reverse-bias each other, therefore no signal is by-passed. D108 is arranged as a noise cancel circuit. The potential at the TP2 point is sharply reduced to a negative voltage when pulse noise comes in, when D108 is released to provide potential to the TP2 point from C158. Thus noise level is reduced.

[FM SECTION]

The FM section has been designed to realize superior characteristics for various spurious responses, or image ratio etc., by integrating in a 3-gang tuning capacitor the tuning circuitry with a matching transformer for 75-ohm and 300-ohm, a FET RF amplifier with an excellent noise figure, stable frequency converter. Further the whole section is housed in an excellent shield cover.

[IF AMPLIFIER]

The signal, converted to 10.7MHz IF frequency at the Frontend, is connected to F101 ceramic filter to remove interfering signals, then amplified up to a certain level by Q101. The output is connected to F102 ceramic filter, where any further interfering signals are removed to obtain the necessary selectivity. F101 and F102 are of the linear-phase type, therefore less distortion in stereo phonic reception is realized. Then the signal is supplied to Q102 the quadrature IC, which has a 3-gang IF amplifier and incorporates these circuits of FM detection, muting and signal strength.

But at the time of AM reception, noises are possible from this IC, therefore in this occasion this IC is designed not to operate by applying some voltage to PIN No 2. The quadrature detection system is adopted for the FM detection circuitry, which operates in combination with the external circuitry of T101, T301 and L102.

AT Pin No 12, output of the muting circuitry, the voltage will be 0V when signals are available, while approximately 4V will appear at no-signal time. By feeding the voltage to Pin No 5, the muting circuitry can be operated. The detection output is available at the Pin No 6, where usually an output of about 350mV appears, which is supplied to Q105, the P.L.L. IC is used for the multiplex to obtain stereo reception. The 76KHz voltage control oscillator is incorporated in the P.L.L. IC, where the 76KHz signal is divided by 2 to make 38KHz for switching of the composite signal. The oscillation frequency is controlled to perfectly match with that of the 19KHz pilot signal of the composite signal, therefore deterioration of the separation etc. caused by the change of ambient conditions is eliminated. For the weak signal, the Pin No 10 is grounded by supplying the muting signal to the base of Q104 to set up monaural signal. The VCO output of 19KHz is available at Pin No 12 of this IC (TP-1), which is controlled by VR103. The separation adjustment is easily done with VR102 by canceling the leak-signals of L- and R-ch. The spurious by VCO will be the interfering signal at the time of AM reception, therefore the oscillator is cancelled by supplying some voltage to Pin No 16.

The discriminated signals appear at Pin No 4 and Pin No 5 which is then connected to the audio amplifier via low-pass filter and de-emphasis circuit. Selection of 75 usec and 50 usec is possible by this switch. The final output of approximately 1V r.m.s. (400Hz, 100% modulation), is obtained with low output impedance from the audio amplifier composed of Q106 - Q109.

REPLACEMENT PARTS LIST

Resistors; 1/4W, $\pm 5\%$ unless otherwise noted

L.....low noise type

Capacitors; P...polyester film, ST...polystyrol, E...electrolytic, T...tantalum,

C...ceramic

LR.....low leakage type, LL.....semi low leakage type

PB-1001

| | | | | | | | |
|------|------|------|------|------|------|------|------|
| R101 | 220 | R125 | 100 | R146 | 33K | R168 | 15K |
| 102 | 330 | 126 | 1K | 147 | 220K | 169 | 3.3K |
| 103 | 5.6K | 127 | 47K | 148 | 330 | 170 | 1K |
| 104 | 330 | 128 | 68K | 149 | 5.6K | 171 | 1K |
| 105 | 680 | 129 | 3.3K | 150 | 47K | 172 | 10K |
| 106 | 100 | 130 | 3.3K | 151 | 33K | 173 | 330 |
| 107 | 33K | 131 | 680 | 152 | 470 | 174 | 3.3K |
| 108 | 33K | 132 | 100 | 153 | 270 | 175 | 1K |
| 110 | 330 | 133 | 1.5K | 154 | 270 | 176 | 47 |
| 112 | 22 | 134 | 3.3K | 155 | 1K | 177 | 10 |
| 113 | 12K | 135 | 3.3K | 156 | 100 | 178 | 2.7K |
| 114 | 180 | 136 | 33K | 158 | 5.6K | 179 | 10 |
| 115 | 10K | 137 | 33K | 159 | 470K | 180 | 8.2K |
| 116 | 15K | 138 | 47K | 160 | 220 | 181 | 33K |
| 117 | 2K | 139 | 470K | 161 | 5.6K | 182 | 47 |
| 119 | 2.2K | 140 | 1K | 162 | 1.2K | 301 | 47K |
| 120 | 47K | 141 | 330 | 163 | 10K | 302 | 33K |
| 121 | 47K | 142 | 470K | 164 | 330K | 303 | 22K |
| 122 | 12K | 143 | 220K | 165 | 220 | 304 | 5.6K |
| 123 | 15K | 144 | 12K | 166 | 3.9K | | |
| 124 | 4.7K | 145 | 5.6K | 167 | 12K | | |

| | | | | | | | |
|------|---------------|----|------|-------------|------|--------|-------|
| C101 | 0.04uF | C | C125 | 47uF 16V E | C147 | 0.02uF | C |
| 102 | 0.04uF | C | 126 | 2.2uF 50V E | 148 | 2.2uF | 50V E |
| 103 | 2.2uF 50V E | | 127 | 2.2uF 50V E | 149 | 0.04uF | C |
| 104 | 220uF 25V E | | 128 | 0.047uF P | 150 | 10uF | 16V E |
| 105 | 0.04uF | C | 129 | 1600pF ST | 151 | 0.04uF | C |
| 106 | 0.04uF | C | 130 | 1600pF ST | 152 | 10uF | 16V E |
| 107 | 0.04uF | C | 131 | 820pF ST | 153 | 0.04uF | C |
| 108 | 2.2uF 50V E | | 132 | 820pF ST | 154 | 0.04uF | C |
| 109 | 0.47uF 50V E | | 133 | 0.056uF P | 155 | 0.04uF | C |
| 110 | 0.04uF | C | 134 | 0.056uF P | 156 | 0.04uF | C |
| 111 | 0.04uF | C | 135 | 470pF C | 157 | 0.04uF | C |
| 112 | 0.02uF | C | 136 | 470pF C | 158 | 47uF | 16V E |
| 113 | 0.04uF | C | 137 | 4.7uF 25V E | 159 | 0.04uF | C |
| 115 | 47uF 16V E | | 138 | 4.7uF 25V E | 160 | 0.04uF | C |
| 116 | 1uF 50V E | | 139 | 33uF 10V E | 161 | 10uF | 16V E |
| 117 | 100pF | C | 140 | 220uF 25V E | 162 | 15pF | C |
| 119 | 33uF 10V E | | 141 | 220uF 25V E | 163 | 22pF | C |
| 120 | 1000pF | ST | 142 | 220uF 25V E | 164 | 330pF | ST C |
| 121 | 1uF 50V E | | 143 | 0.033uF P | 165 | 0.02uF | C |
| 122 | 0.33uF 35V ET | | 144 | 4700pF C | 166 | 0.04uF | C |
| 123 | 0.47uF 50V E | | 145 | 0.04uF C | 167 | 10pF | C |
| 124 | 0.33uF 35V E | | 146 | 4700pF C | 168 | 0.04uF | C |
| | | | | | 169 | 1000uF | E |
| | | | | | 170 | 0.01uF | C |

| | | | | | |
|------|---------|------|---------|------|---------|
| Q101 | 2SC1674 | Q106 | 2SC1222 | Q110 | 2SD235 |
| 102 | HA1137 | 107 | 2SA640 | 111 | 2SC1674 |
| 104 | 2SC1674 | 108 | 2SC1222 | 112 | 2SC372 |
| 105 | LA3350 | 109 | 2SA640 | 113 | 2SC1674 |

| | | | | | |
|------|--------|------|--------|------|--------|
| D101 | 1S2473 | D106 | 1K188 | D111 | 1K188 |
| 102 | WZ140 | 108 | VD1221 | 112 | VD1121 |
| 104 | 1N4002 | 109 | 1S2473 | 301 | 1S2473 |
| 105 | 1K188 | 110 | 1K188 | 302 | 1K188 |

[PEAK INDICATOR CIRCUIT]

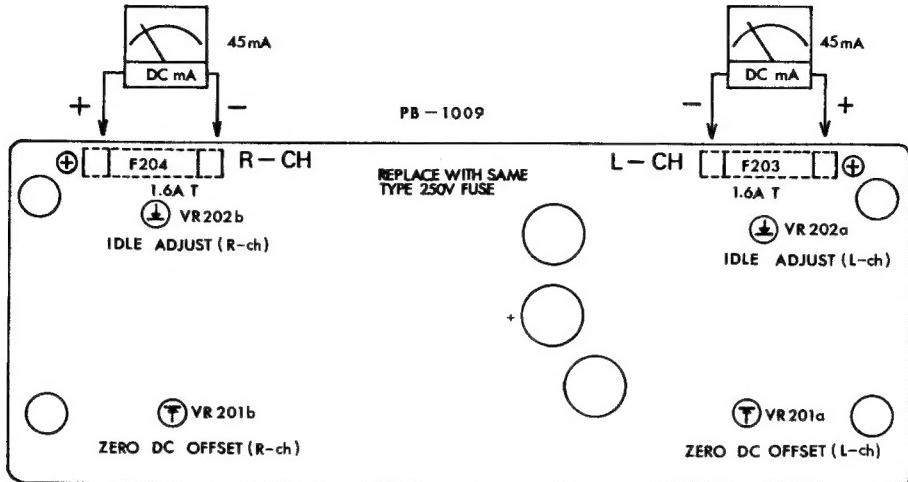
The output signal passed through the "Peak Indicator Sensitivity Selector Switch" meets the Peak Detection circuit composed of Q501, Q502, D506 and C506, whose detected DC signal is then converted into low-impedance by current booster Q503 and Q504.

Of course different threshold level is arranged for each LED driver Q505 - Q510 to make them light up in accordance with the signal level.

[A.F.C.C.--- Automatic Filter Control Circuit]

At the time of AM reception, if the higher order harmonics caused by cliping of power amp are fed back to the AM antenna, the operation will be unstable. Therefore the harmonics passed through the high pass filter Q601 are detected by D601, which controls the electronic high frequency attenuator Q602 and C602 connected to the output of AM detector. Thus unstable factors such as oscillation are eliminated.

IDLE ADJUST & ZERO DC OFFSET



1. Idle Adjust

VR202a (L-ch) and VR202b (R-ch) on PB1009 are semifixed potentiometer for quiescent current adjustment of the power transistors.

First, remove both fuses of F203 (L-ch) and F204 (R-ch), and then insert a DC ammeter between the fuse grips. (⊕ for the edge-side grip)

After one minute of POWER-ON, adjust VR202a and VR202b respectively to have 45mA reading on the meter.

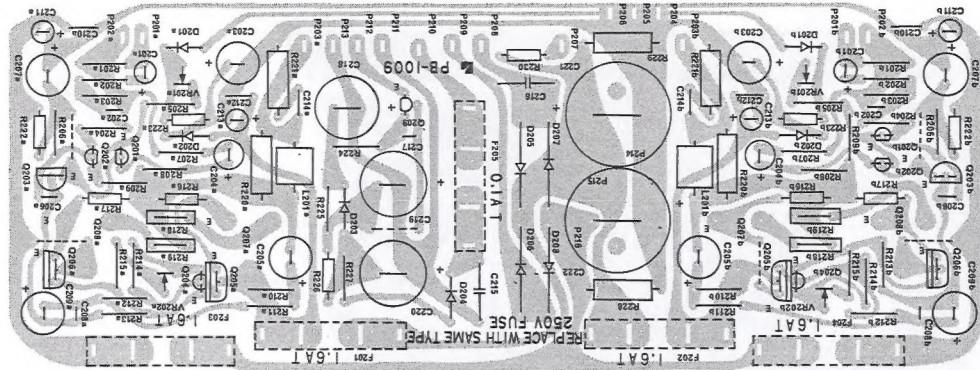
2. Zero DC Offset

VR201a (L-ch) and VR201b (R-ch) on PB1009 are semifixed potentiometers for the Zero DC Offset adjustment of the power amplifier section. Connect a DC milivolt meter to the speaker terminals and adjust VR201a and VR201b respectively. The DC offset voltage should be within $\pm 50\text{mV}$.

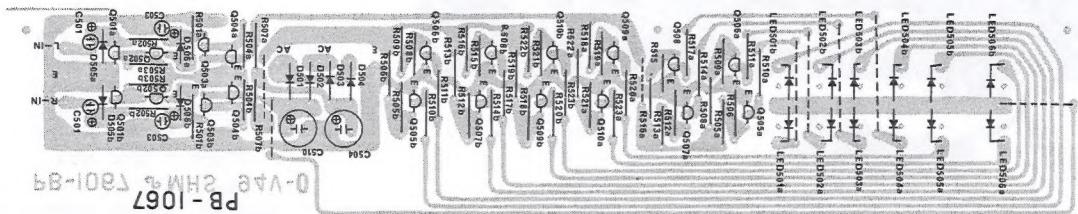
RF SECTION ALIGNMENT PROCEDURE

| STEP | SIGNAL SOURCE CONNECTED TO | SET SIGNAL TO | SET DIAL TO CONNECTED TO | OUTPUT INDICATOR | ADJUST | ADJUST FOR |
|------|---|---|----------------------------------|--|------------------------------------|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | DCVTVM PB1001 point 19 | check | 13 - 14 DCVTVM reading |
| 4 | Output of sweep generator to PB1001B 36 and ground | +40KHz sweep cnetred at 455KHz generator output level 40dB - 50dB | Quiet point on band near 1600KHz | Oscilloscope PB1001B terminal TP-2 | T104 core | Maximum symmetrical response. |
| 5 | Standard radiating loop antenna placed near AM built-in antenna | 600KHz at 400Hz, 30% modulation Field strength 50dB/m -80dB/m | 600KHz | Oscilloscope ACVTVM output terminal | T105 core Bar antenna coil L401 | Dial pointer to be tuned at 600KHz. Maximum ACVTVM reading - Slide coil bobbin |
| 6 | | | | | TC305 | Dial pointer to be tuned at 1400KHz |
| 7 | | 1400KHz at 400Hz, 30% modulation Field strength 50dB/m - 80dB/m | 1400KHz | | TC304 | Maximum ACVTVM reading |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | Standard radiating loop antenna placed near AM built-in antenna | 1000KHz at 400Hz, 30% modulation Field strength 126dB/m | 1000KHz | | VR104 | Set pointer of signal strength meter to the right hand dot mark. |
| 12 | | 600KHz at 400Hz, 30% modulation | 600KHz | Oscilloscope ACVTVM Distortion Meter | | IHF maximum usable sensitivity which is equivalent electric field strength at the loopstick antenna adjusted by attenuator of AMSG so that noise and distortion can be -20dB of total output. |
| 13 | | 1400KHz at 400Hz, 30% modulation | 1400KHz | output terminal | | |
| 14 | | | | | | |
| 15 | | | | | | |
| 16 | | | | | | |

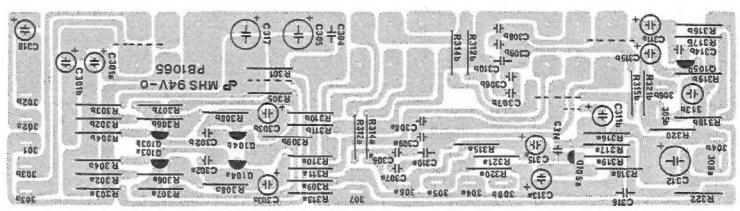
| STEP | Signal Source Connected to | Set Signal to | Set Radio Dial to | Output Indicator Connected to | Adjust | Adjust for |
|------|--|--|--|--|--|--|
| 17 | FM signal generator Across FM antenna terminals (300-ohm) through matching network. | Reduce the output level to zero. (interstation receiving condition) | Quiet point on band near 98MHz | T301 | Center indication of the tuning meter. | |
| 18 | | 98MHz at 400Hz, 100% modulation Output level 1mV | Correct reception of 98MHz signals of FMSS at the center of tuning meter | T101 Oscilloscope Distortion Meter ACVTVM output terminals | Minimum distortion. | |
| 19 | | Repeat steps 17, 18 so as to get distortion of less than 0.1 - 0.2%. | | | | |
| 20 | FM signal generator Across FM antenna terminals | 108MHz at 400Hz, 100% modulation, generator output level 1.5 - 2uV | 108MHz | Oscilloscope Distortion Meter ACVTVM output terminals | TC301 TC302 | Maximum output level (Hands Off ; TC303) |
| 21 | through 300-ohm matching network | 98MHz at 400Hz, 100% modulation, generator output level 1.5 - 2uV | 98MHz | output terminals | L305 | Maximum output level |
| 22 | | Put the muting switch to "ON". | | | | |
| 23 | FM signal generator Across FM antenna terminals through 300-ohm matching network. | 98MHz at 400Hz, 100% modulation generator output level 2.2uV | 98MHz | Oscilloscope ACVTVM output terminals | VR101 | Fix VR101 at the point where output audio drops by 1dB. |
| 24 | | Repeat steps 17, 18 and check that it gets distortion of less than 0.1 - 0.2%. | | | | |
| 25 | | Remove wiring made at step 15. | | | | |
| 26 | FM signal generator Across AM antenna terminals through 300-ohm matching network. | 98MHz no modulation generator output level 1mV | 98MHz | Frequency Counter PB1001B, TP-1 | VR103 | Adjust the frequency of P.L.L. VCO at 19kHz. |
| 27 | | 98MHz at 19kHz, 10% (Lch) 400Hz 90% 98MHz at | 98MHz | 15KHZ L.P.F. ACVTVM output terminal | VR102 | Reh output level to minimum. Lch output level to minimum. |



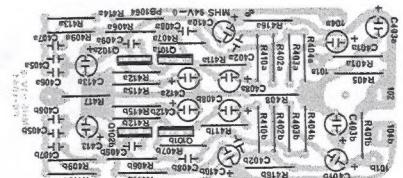
PB-1009



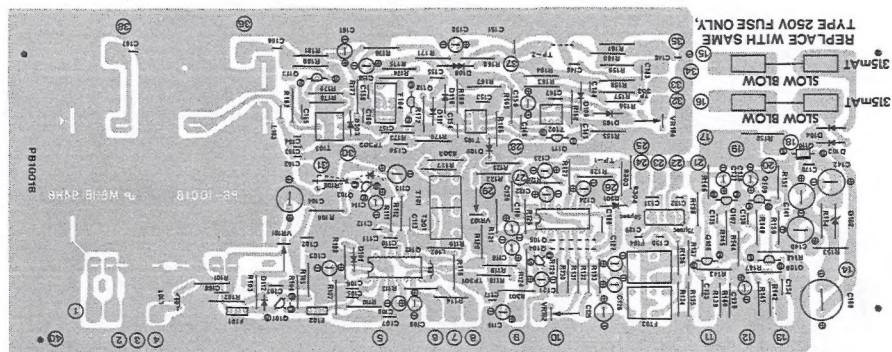
PB-1067



PB-1065



PB-1064



PB-1001